DOCUMENT RESUME

ED 244 437 EC 162 450

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TITLE A Correlational Analysis of the Statistical Properties of Time-Series Data and Their Relationship to Student Achievment in Resource Classrooms.
INSTITUTION Minnesota Univ., Minneapolis. Inst. for Research on Learning Disabilities.
SPONS AGENCY Special Education Programs (ED/OSERS), Washington, DC.
REPORT NO IRLD-RR-138
PUB DATE Sep 83
CONTRACT 300-80-0622
NOTE 39p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Elementary Education; *Learning Disabilities; *Measurement Techniques; Research Methodology; Statistical Distributions; Student Evaluation

ABSTRACT

Resource room students (N=68) in grades 1-7 of three rural and suburban Minnesota school districts participated in a study of time series data generated by a curriculum-based measurement system. A principal components factor analysis was performed to summarize relationships among the time-series properties and properties of the measurement system. In addition, multiple regression analyses were used to identify the relationship of such variables to achievement. Results indicated that the statistical characteristics of time-series data are not necessarily independent in naturally occurring data, and can be used in predicting achievement. Findings had implications in training practitioners in the use and interpretation of measurement systems based on time-series data. (Author/CL)

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ED244437

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Research Report No. 138

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Russell Skiba and Stanley L. Deno

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September, 1983

Abstract

Research has shown that statistical properties of time series data can influence visual inference based on those data; little research, however, has investigated the interactions of these properties in experimentally generated data. In the current study, time series data for 68 students generated by a curriculum-based measurement system were analyzed. A principal components factor analysis was performed to summarize relationships among the time-series properties and properties of the measurement system. In addition, multiple regression analyses were used to identify the relationship of such variables to achievement. Results indicated that the statistical characteristics of time-series data are not necessarily independent in naturally occurring data, and can be used in predicting achievement. Implications for training practitioners in visual inference are discussed.

A Correlational Analysis of the Statistical Properties of Time-Series Data and Their Relationship to Student Achievement in Resource Classrooms

In recent year, considerable controversy has been generated regarding the appropriate method for analyzing time-series data. Visual analysis of the data has been favored by many practitioners (Kratochwill, 1978). Those who favor visual inference argue that it increases the probability that only large, practically significant changes will be detected (Parsonson & Baer, 1978). Advocates of solely visual analysis also have asserted that reliance on post-hoc statistical procedures may lead researchers to ignore the necessity of maintaining strict experimental control (Michael, 1974), and may reduce the generalizability and replicability of experiments.

On the other hand, it has been argued that the statistical characteristics of time-series data make them too complex for reliable visual analysis. Jones, Weinrott, and Vaught (1978) have shown that small changes that are statistically significant may not be detected by visual inspection of the graphed data. These nondramatic but reliable effects may, in fact, prove clinically significant under some conditions (Kazdin, 1976). Finally, unique properties of time-series data, such as serial dependency (the tendency for successive data points to be correlated and thus nonindependent), may cause decreases in the reliability of visual analysis. Jones et al. (1978) found that under conditions of serial dependency, inter-observer agreement using visual analysis was only .39.

In addition to serial dependency, other properties of time-series data may affect the nature of the conclusions drawn from such data.

Jones, Vaught, and Weinrott (1977) noted that judgments made about the impact of an intervention on time-series data could be influenced by stability of baseline behavioral scores, variability of the data within and across phases, number of data points, and changes in level of performance. Kazdin (1976) identified the overall trend or slope of the data, and changes in that trend, as another important consideration.

Furlong and Wampold (1982) investigated the effects of various statistical properties of time-series data on the judgments made about those data. They generated graphs that varied along the dimensions of level, trend, scaling, and variation. Ten reviewers, members of the Journal of Applied Behavior Analysis editorial board, were instructed to sort the graphs into as many categories as they wished. Analyzing the reviewers' sorting strategies, the investigators concluded that the majority of experts classified the time-series data according to common intervention patterns. Only a minority appeared to take variability into account when making visual inferences. Further, reviewers who attended only to the absolute size of intervention effects classified the effect patterns less adequately.

In a similar study, DeProspero and Cohen (1979) generated time-series of the "ABAB reversal" type, and sent them to 250 reviewers of behavioral journals for judgments on degree of experimental control expressed by the data. Visual inspection of the data resulted in a mean inter-rater agreement of .61 between pairs of judges assigned the same graph. A mean shift in the data pattern consistent with the hypothesized effect of the experimental variables was the most

important influence on visual inference. Variability was attended to less well. Noting the wide range of opinions concerning the important characteristics of any given data display, DeProspero and Cohen concluded that a behavioral researcher relying on visual analysis "would not be likely to get the same answer twice" (p. 578) and recommended supplementing any visual analysis with statistical analysis.

Tindal, Deno, and Ysseldyke (1983) investigated the effects of various combinations of slope and variability on reliability of visual judgments, using classroom teachers as subjects. The teachers were trained in techniques of visual inference, then asked to determine the effectiveness of the program depicted on time series varying along the dimensions of slope and variability. The results indicated that slope and variability influenced visual judgments, both singly and in interaction. Reliability of visual inference was influenced by variability, and decreased most when variability increased between phases. In addition, the use of aimlines as an aid in visual analysis did not seem to have an effect on the reliability of visual analysis.

Research thus seems to indicate that statistical parameters do influence both the types, and the reliability, of judgments made through visual analysis of time-series data. Decisions made on the basis of visual inference seem most influenced by change in the mean level of performance and trend, while variability is attended to less well. Yet variability seems to have a major impact on the reliability of visual analysis.

While research has begun to investigate some of the statistical parameters that influence time-series analysis, many areas remain

unexplored. All of the research to date has used artificially generated time series, randomly varying the data characteristics under investigation. Yet, it is possible that the statistical properties of time-series data, such as slope, variability, and trend, covary in a nonrandom fashion in data generated in experimental, clinical, or classroom situations. If this is indeed the case, it may be important to train teachers, and others who will make decisions based on the data, to attend to these characteristics and their interaction. In addition, little attention has been given to possible relationships between such characteristics and long-term outcomes, such as student achievement. It may well be that variability or number of data points are as important in predicting outcome as are more attended to attributes, such as trend or level.

The purpose of the current study was to investigate the statistical properties of time-series data generated by a curriculum based measurement system in reading. The use of actual student data allowed exploration of the relationships among various characteristics of the data. In addition, the current study was designed to determine whether properties of a system based on time-series data analysis can be used in predicting reading achievement.

Method

Subjects

The subjects were 68 resource room students in three rural and suburban Minnesota school districts. All subjects were participants in research on the effects of teachers using frequent curriculum-based measures of student performance. Subjects ranged in grade placement

from first to seventh grade; the distribution of students by grade level is shown in Table 1.

Insert Table 1 about here

All students were receiving some resource room instruction and had been receiving such special instruction for anywhere from a few months to six years ($\bar{X}$ = 1.96 years). The time spent in reading instruction in the resource room ranged from 15 minutes to 105 minutes per day, with a mean of 46 minutes per day. The students' teachers averaged two years teaching experience in regular education, and five years in special education.

Measures

The independent variable for all analyses, student performance on a curriculum based time-series measurement system, was measured through the statistical properties of that system, described in the Procedures section. The dependent measures were two measures of achievement: timed reading samples from three third grade passages (Deno, Mirkin, & Chiang, 1982) and four subtests of the Stanford Diagnostic Reading Test (SDRT).

Achievement measures. At three different points in time during the study, three one-minute oral reading measures, consisting of randomly selected passages from the third grade level in Ginn 720, were administered to the students. These measures were selected because of their technical adequacy (Deno et al., 1982) and sensitivity to change (Marston, Lowry, Deno, & Mirkin, 1981). These

curriculum-based measures had been found to be as reliable and valid as traditional standardized tests, yet more likely to reflect small changes in performance. The measurements were conducted by directing the student to begin reading at the top of the page and continue reading for one minute, at which time the examiner would say stop. If the student came to a word he/she did not know, the examiner would supply the word and prompt the reader to continue. While the student was reading, the examiner followed along on a copy of the passage and marked errors of substitution and omission. Following the reading, the numbers of words read correct and incorrect were counted and recorded, with no feedback given to the student. These three reading measures were given at the beginning of the study (pretest), in the middle, and immediately at the end of the study.

Two subtests from the Stanford Diagnostic Reading Test (Karlsen, Madden, & Gardner, 1976) also were given as posttest measures. The Structural Analysis and Reading Comprehension subtests were administered along with the reading passage measures. Each of the SDRT subtests has two parts, with Structural Analysis focusing on syllabication (blending and division) and Reading Comprehension focusing on answering both literal and inferential questions for previously read passages.

Procedures

The resource room teachers were trained in the use of the measurement procedures during a series of three half-day workshops at the beginning of the school year. Training was based on the manual, Procedures to Develop and Monitor Progress on IEP Goals (Mirkin, Deno,

Fuchs, Wesson, Tindal, Marston, & Kuehnle, 1981). The teachers continued to use the measures over the entire school year. Visits by observers in December, February, and May, and frequent phone contacts, provided feedback to the teachers on the accuracy of their implementation of the measures.

Measurement consisted of one-minute timed samples of reading from the student's curriculum. Based on the results of previous research, the placement level for testing was set at a criteria of 20-29 words correct per minute for grades 1 and 2, and 30-39 words correct per minute for grades 3-7. Once this level was determined, passages were chosen randomly from the placement level textbook for measurement purposes. Measurements were conducted three to five times each week. Both number of words read correctly and number of errors in one minute were recorded, and plotted on an equal interval chart. Continuous graphed results allowed teachers to develop a visual record of student progress, similar to the one represented in Figure 1.

Insert Figure 1 about here

Teachers were instructed to write IEP long-range goals (LRG) using both the entry level criteria and a desired year-end mastery criteria, usually 70 words correct per minute with no more than 7 errors. The formula used in writing the long-range goal is shown in Figure 2.

Insert Figure 2 about here

Short-term objectives were based on the long-range goals. In order to compute the short-term objective, teachers first subtracted the baseline level of performance from the criterion level listed in the LRG. Dividing this difference by the number of weeks until the annual review, they arrived at the number of words per week gain necessary to meet the long-range goal criteria. The format used for writing short-term objectives is given in Figure 3.

Insert Figure 3 about here

In addition, the teachers were trained at the beginning of the year, and again at mid-year, in the use of the measurement procedures for evaluation of the instructional program. In order to monitor student growth, the baseline reading level and the long-range goal were connected by an aimline that showed the students' desired progress. Every seven data points, the teachers were to evaluate student growth using a decision rule that required use of the quarter-intersect method (White & Haring, 1980) to determine slope. An example is given in Figure 1. If the student was progressing at a rate equivalent to or greater than that indicated by the aimline, the instructional program was continued; if the projected rate of growth was less than that indicated by the aimline, the teacher was to make a substantial change in the student's program.

Student performance data on the direct repeated measures were collected and charted over a six-month period for the 68 resource room students. Variables generated from these graphed performance data for experimental analyses are discussed below.

Design

The analyses used in the current study were correlational. Descriptive analyses for all variables except steepness of the aimline are presented elsewhere (Skiba, Marston, Wesson, Sevcik, & Deno, 1983).

To explore the relationships among the properties of the data, a factor analysis was performed in order to summarize a large number of correlations. Variables included in the analysis were those variables available to the teacher in a visual analysis of student time-series data. The first subset of variables generated were those commonly identified in time series literature as influential in visual inference: level of performance, trend, variability, and number of data points. Two measures of level of performance were included: the Y-intercept (Y-INT) as an estimate of baseline performance, and the mean level of performance for the year (MY). Based on the six months of graphed performance data, the overall trend of the data was estimated by computing a regression slope for each individual (SLOPE). In order to test the probability that the slope represented a significant trend in the student's reading performance over time, and not an artifact of random variability, the c-statistic[1] was applied to each individual time-series, as recommended by Tryon (1982). The z-score of the c-statistic (Z-SCORE)[2] was used as an estimate of the

significance of the slope. Variability was measured by the standard error of estimate (SEE) of the regression slope. Number of data points (DATAPTS) was measured in terms of number of measurements per week, since such a measure proved more comparable across teachers than total number of data points (which was highly influenced by beginning and end of year school schedules).

In addition, a number of variables specific to the curriculum based measurement system employed were included in the analysis, since these could be expected to influence the time series data pattern. The aimline (AIMLINE) was calculated using the formula for the short-term objective, and served as an estimate of student progress necessary to reach the long-range goal from the Y-intercept. Student success in meeting the goal was estimated both in terms of whether the goal was met at least once (GOAL) and by the number of times the long-range goal was exceeded in the time series (NGOAL). The number of phase changes was measured by the number of instructional interventions (CHANGE) implemented over the course of the school year.

In order to determine whether any property or properties of the time-series data could be useful in predicting reading achievement, a series of regression analyses was performed with the achievement measures as dependent variables. The indeperdent variables were the variables listed above: mean for the year, Y-intercept, number of data points per week, slope, number of instructional changes, standard error of estimate, z-score of c-statistic, whether the goal was met, number of times the goal was met, and steepness of the aimline. Since school achievement has been shown to be correlated most highly with

entering student ability (Bloom, 1976; Borg, 1980), two methods of controlling for achievement were used. First, pretest achievement (as measured by passage data) was forced as the first independent variable for all regression analyses conducted on the scores obtained during the third data collection. Second, two gain scores were calculated: a score representing the absolute gain in words read per minute between the first and third timed passages, and the conversion of these absolute gain scores into percentage gain. Achievement was standardized by grade to control for age effects (except for gain scores, which were based on raw data).

Results

Results are presented in two sections. First, the relationship among the variables was investigated by performing a factor analysis. Second, the relationship of these variables to student achievement was explored through regression analyses. Descriptive data for the 10 variables examined are presented in Table 2.

Insert Table 2 about here

Relationships Among the Variables

A principal components factor analysis of the time-series variables was performed. Factors with eigenvalues equal to or exceeding 1.00 were rotated, and variables that correlated with the factors at a level of .30 or greater were analyzed. The three factors retained accounted for 67.6% of the total variance. As indicated in Table 3, the items that correlated most strongly with Factor 1 have to

do with level of performance, such as the Y-intercept or the mean level of performance for the year. The standard error of estimate, and both goal-meeting variables, also loaded moderately on this factor, while number of instructional interventions loaded moderately negatively. Factor 1 accounted for 30.1% of the variance. Factor 2, explaining 23% of the variance, was most heavily influenced by the Z-score, a measure of the significance of the slope and the number of data points per week. The number of times the goal was met correlated moderately with this factor, while the Y-intercept and the standard error of estimate loaded moderately negatively on Factor 2. Factor 3 could be conceptualized as a aimline/slope factor and accounted for 14.4% of the total variance. The number of times the goal was met showed a moderate negative correlation with this factor.

Insert Table 3 about here

Relationship of Time-Series Variables to Achievement Variables

Results of the regression of the time-series variables on achievement measures are presented in Table 4. As can be noted in the second column, the number of times students met their goal and the number of data points per week strongly predicted achievement on the majority of the achievement measures. It is interesting to note the increase in the proportion of residual variance explained by the time-series characteristics from the Time 2 passage scores to the Time 3 passage scores. Mean level of reading performance for the year and the Y-intercept level are moderate predictors of overall gain on the

passages (Passage Gain Score). Number of changes made in the students' instructional program negatively predicted scores on the SDRT comprehension subtests and total score, while steepness of the aimline drawn by teachers at the beginning of the year negatively predicted performance on both final passage scores and overall gain in words read per minute.

Insert Table 4 about here

Discussion

Previous analyses of computer generated time series have indicated the influence of statistical properties of the data in visual inferences made regarding the data. Yet the majority of these studies have explored the properties in isolation, seldom taking into account interactions that may occur in experimentally generated data. The current analysis explored the relationships among the characteristics of a curriculum-based measurement system based on time-series analysis. In addition, the relationship of such characteristics to student achievement in naturally occurring time-series data was investigated.

The current results seem to indicate that the most distinctive and influential property of time-series data is the level of performance. The level of performance factor accounts for 30% of the variance in the principal component factor analysis; this figure is reminiscent of the 25%-40% of variance that Bloom (1976) suggested is accounted for by cognitive entry variables in any analysis of student

achievement. In addition, heavy loadings of the mean for the year, as well as the Y-intercept (entry level), indicate that this factor remains important throughout the school year. As Bloom (1976) had noted, cognitive entry variables remain, unfortunately, the most powerful predictor of academic outcome.

The correlation of variability with the level of performance factor has interesting implications for time-series analysis. Future investigations of time-series data may need to take into account the tendency of scores at a higher level to show greater variability. Since increased variation has been shown to influence the accuracy of decisions made about time-series data, these results also may indicate that visual inference may be inherently more difficult at higher performance levels. These results are especially important in light of the common failure to take variability into account in visual analysis (Furlong & Wampold, 1982).

Number of changes in the student's instructional program correlated negatively with both the goal-meeting variables in Factor 1, and reading achievement. Since instructional interventions were intended to accelerate slopes and increase the probability of meeting the long-range goal, these negative correlations are, at first glance, somewhat disturbing. Given the small number of changes made in students' instructional programs, however, it is likely that the correlations reflect the fact that changes were made only for students with extremely flat slopes. In order to evaluate the effectiveness of interventions, further investigations will need to focus on changes in trend and variability resulting from individual interventions.

A positive correlation between the steepness of the aimline initially set by the teacher and the regression slope based on actual student data indicates that student time-series performance may in fact be influenced by teacher expectations. This correlation confirms the tendency noted by the investigators for time-series data to follow the aimline, and provides a caution against setting goals at too low a level. Yet, these data do not support the thesis that setting goals higher will always accelerate student performance (Lindsley, 1982). The moderate negative correlation between the number of times the goal was met and the aimline/slope factor indicates that setting goals at too high a level may actually decrease student success in reaching that goal. This conclusion is supported further by negative correlations between aimline and achievement measures: the steeper the aimline, the poorer the achievement.

Similarly, excess variability often is regarded negatively in time-series analysis. In the current analysis, variability showed no relationship to slope, although it bore a moderate negative relationship to the significance of the slope. Yet the standard error of estimate did not explain a significant proportion of the achievement variance in any of the regression analyses. Thus, while variability may play a part in determining the significance of trends in the data pattern, it does not appear to be a useful predictor of long-term outcomes.

The number of data points per week appears to be a strong predictor of both the z-score of the slope, and performance on measures of reading achievement. A number of explanations could be

offered. Increased measurement could simply afford increased reading practice; however, given that this practice could amount to a maximum of 3 to 5 minutes per week, this seems relatively unlikely. A more plausible suggestion might be that increased measurement provided increased performance feedback to both the student and teacher. This feedback may in turn promote subtle instructional changes or increased motivation for students to achieve their goals in reading.

Another strong predictor of reading achievement was the number of data points that exceeded the long-range goal. The long-range goals were, for the most part, set so that students would reach their goal with an average of 1 to 2 words per minute gain per week. These data thus provide some confirmation that this rate of reading growth predicts positive achievement outcomes, and may well be an appropriate rate of reading growth for students in special settings. These findings also argue for the predictive validity of frequent, curriculum-based measurement, since success on the daily measures predicted success on long-term achievement measures.

It is interesting to compare the results of the current regression analyses with similar analyses performed on this population using teacher effectiveness variables derived from process-product research (cf. Skiba, Sevcik, Wesson, King, & Deno, 1983). Only one of the 12 independent variables investigated in that study, Frequency of Correct Answers, predicted reading achievement at statistically significant levels, and the proportion of residual variance explained ranged from 1-3%. Both the number of data points per week, and the number of times the goal was met, explained a somewhat greater

proportion of residual variance, ranging as high as 28%. Variables such as academic engaged time, investigated in process-product research, have proven useful predictors of achievement in regular education; variables more directly related to monitoring student academic progress may prove to be more valuable in predicting outcomes in special education.

These findings have important implications in training practitioners in the use and interpretation of measurement systems based on time-series data. First, results indicate that properties of time-series data, such as level and variability are not independent of each other in naturally occurring data. Thus, it may be necessary to train practitioners to attend to interactions between time-series characteristics when making judgments based on visual inference. Second, in predicting long-term outcomes, properties such as frequency of measurement may be as important as more commonly attended to attributes, such as level and trend. Neither of these findings is particularly surprising, yet both represent important qualifications to the current methodology of time-series analysis.

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Footnotes

The authors gratefully acknowledge the contributions of Dr. Gerald Tindal in directing our attention to the c-statistic as a method of time-series analysis.

[1]The actual calculations involved in the c-statistic, as cited by Tryon (1982), are:

$$C = 1 - \frac{\sum_{i=1}^{N-1} (X_i - X_{i-1})^2}{2\sum_{i=1}^{N} (X_i - \bar{X})^2}$$

where the numerator of the right hand term is the sum of the (N-1) squared consecutive differences associated with the time series. The denominator is twice the sum of the (N) squared deviations of the time-series data points from their norm.

[2]The standard error of the c-statistic is

$$Sc = \sqrt{\frac{N+2}{(N-1)(N+1)}}$$

The c-statistic may be converted to a z-statistic and tested for significance through the following ratio:

$$Z = \frac{C}{Sc}$$

Table 1

Distribution of Students by Grade Level

Grade	Number of Students	Percentage
1	2	2.9
2	18	26.5
3	15	22.1
4	16	23.5
5	12	17.6
6	3	4.4
7	2	2.9

Table 2

Descriptive Statistics for Time-Series Variables

	Mean	SD
Y-intercept	37.01*	11.25
Mean level for the year	51.03*	11.67
Standard error of estimate	10.04*	4.28
Slope	1.56**	.87
Aimline	1.68**	.53
Number of data points/week	2.59	.67
Number of instructional interventions for the year	.67	1.14
Z-score of the C-statistic	3.32	2.43
Number of times goal level was exceeded	8.54	9.26

	Frequency	Percentage
Students reaching long-range goal at least once	58	85.3%

*Expressed in words per minute
**Expressed in words per minute gained per week

Table 3

Results of Principal Components Factor Analysis

Variables[a]	Factor 1[b]	Factor 2	Factor 3
Y-INT	.6854	-.4093	-.0760
MY	.8802	-.0689	.1592
SEE	.5220	-.4026	-.1259
SLOPE	.2778	.3362	.4633
AIMLINE	-.0053	-.1265	.7565
DATA PTS	-.0087	.7380	-.1001
CHANGE	-.4463	-.0731	-.1653
Z-SCORE	-.1284	.9324	.0539
GOAL	.5460	.0242	-.0192
NGOAL	.6215	.4444	-.3235

[a] Y-INT = Y-intercept
MY = Mean level of performance for the year
SEE = Standard error of estimate of the regression slope
SLOPE = Regression slope
AIMLINE = The trend of the aimline drawn by the teacher between the Y-intercept and the long-range goal level
DATAPTS = Number of data points per week
CHANGE = Number of instructional interventions over the course of the school year
ZSCORE = The z-score of the c-statistic (see Footnote 1)
GOAL = Binary variable indicating whether the goal was met at least once
NGOAL = The number of times the long-range goal level was exceeded in the time-series

[b] Variables loading positively or negatively on the factor are underlined. The level chosen for analysis was ± .30.

Table 4

Summary of Regression of Time-Series Characteristics on Achievement Measures

	Proportion of Variance Accounted for by Pretest Achievement[a]	Independent Variables with Significant Beta-weights[c]	Sign	Proportion of Residual Variance	Proportion of Residual Variance Accounted for by All Independent Variables
Passage Score - Time 3 (N=56)	.32	NGOAL***	(+)	.18	.29
		AIMLINE**	(-)	.04	
SDRT - Comprehension Subtests (N=57)	.20	CHANGE**	(-)	.09	.21
		GOAL*	(+)	.04	
SDRT - Structural Analysis Subtests (N=57)	.35	--	--	--	.05
SDRT - Total Score	.35	CHANGE**	(-)	.05	.08
Passage Gain Score[b] (N=55)	--	NGOAL***	(+)	.28	.56
		Y-INT**	(+)	.11	
		DATAPTS*	(+)	.04	
		AIMLINE*	(-)	.04	
		MEAN/YEAR*	(+)	.04	
Percent Gain (N=55)	--	DATAPTS***	(+)	.23	.35

[a]The passage score at time 1 was used to control for entering achievement.

[b]Gain in words read per minute from the third grade passages from time 1 (October) to time 3 (May).

[c]DATAPTS = Number of data points per week
NGOAL = Number of times goal was met
CHANGE = Number of changes made in the instructional program
MEAN/YEAR= Mean level of performance for the year
AIMLINE = Steepness, in words per week, of the aimline drawn by the teacher
Y-INT = Y-intercept.

[d]The proportion of the residual variance accounted for by the variable listed in Column 2, where residual variance refers to the variance remaining in the post-achievement measure after entering achievement at time 1.

[e]The proportion of the residual variance accounted for by all independent variables after accounting for pre-achievement.

*$p \leq .10$
**$p \leq .05$
***$p \leq .001$

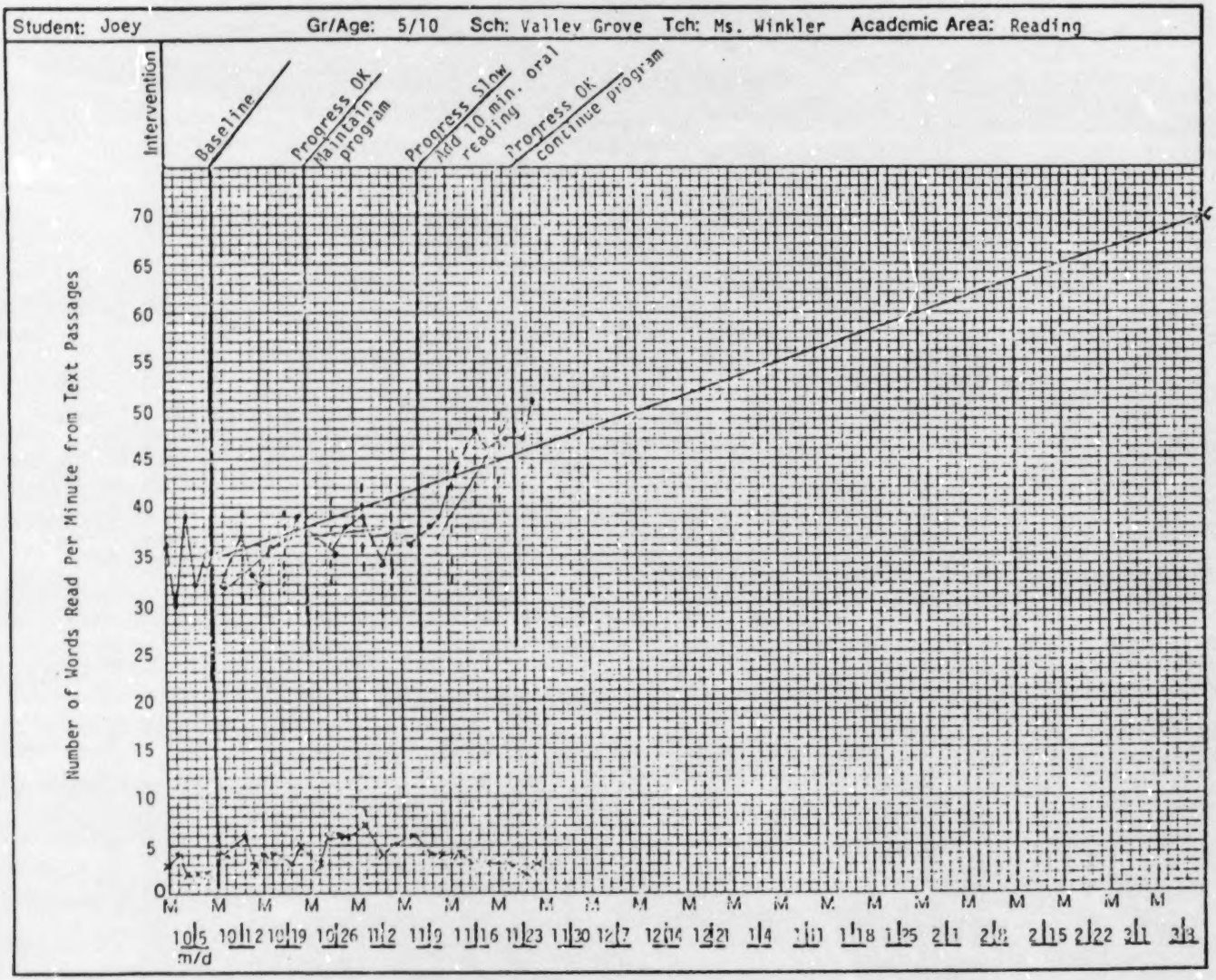

Figure 1. Example of Individual Time-Series Data.

	Condition	Behavior	Criteria
LRG:	In _____ (total # weeks) weeks, when presented with stories from Level ____ (#), _____ (reading series),	student will read aloud	at the rate of 50 wpm or better 5 or fewer errors.

Figure 2. Format for Long-Range Goal: Reading

	Condition	Behavior	Criteria
STO	Each successive week, when presented with a random selection from Level _____ (#) of _____ (reading series),	student will read aloud	at an average increase of _____ (repeated-actual performance/total # weeks) words correct/ minute and no increase in errors.

Figure 3. Format for Short-Term Objective: Reading

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